Contents Part A

Regular Research Papers

Study of some active wear mechanisms in a titanium-based cermet when machining steels 1
H. Thoors, H. Chandrasekaran and P. Ölund (Stockholm, Sweden)

Wear mechanisms of ultrahard, non-metallic cutting materials 12
W. König and A. Neises (Aachen, Germany)

Ceramic tool wear when machining austempered ductile iron 22
I. R. Pashby, J. Wallbank and F. Boud (Coventry, UK)

Machinability of steels and titanium alloys under lubrication 34
H. Hong, A. T. Riga, J. M. Cahoon and C. G. Scott (Wickliffe, OH, USA)

Mechanisms of hard alloy wear in frictional processes with polymers and composite materials 40
A. L. Zaitsev (Gomel, Belarus)

Friction behavior of ceramic fiber-reinforced aluminum metal-matrix composites against a 440C steel counterface 47
S. V. Prasad and K. R. Mecklenburg (Wright Patterson Air Force Base, OH, USA)

The performance of aluminium alloys and particulate reinforced aluminium metal matrix composites in erosive–corrosive slurry environments 57
J. A. Bester and A. Ball (Rondebosch, South Africa)

Tribological behaviour of aluminium alloy composites: a comparative study with a copper-based alloy 64
S. Das and B. K. Prasad (Bhopal, India)

Influence of carbon content of martensitic matrix and retained austenite on wear of martensitic ductile iron 75
C.-G. Li, Q.-D. Zhou (Xian, China), G.-S. Song and Z.-S. Fang (Hubei, China)

Influence of retained austenite on the wear resistance of high chromium cast iron under various impact loads 83
X. Jun-Tong, Z. Qing-De (Xian, China), L. Shi-Hui and S. Guang-Shun (Hubei, China)

Friction and wear behaviour of mosaic surfaces formed by laser line remelting of cast iron 89
D. Lauper, D. Elliott and G. Zambelli (Lausanne, Switzerland)

Microscopic deformations in KCl single crystals by indentation and scratching with steel ball and pyramidal indenters 92
S. Kobayashi, T. Okui and S. Miura (Kyoto, Japan)

Friction microprobe investigation of particle layer effects on sliding friction 102
P. J. Blau (Oak Ridge, TN, USA)

Material response to two-dimensional scratching by wedges 110
S. V. Kailas and S. K. Biswas (Bangalore, India)

Characterization of wear behavior of steel and ceramics in the VAMAS round robin tests 119
Y. Enomoto and K. Mizuhara (Ibaraki, Japan)

Accelerated wear testing using the grit size effect 126
D. Forrest, K. Matsuoka, M.-K. Tse and E. Rabinowicz (Cambridge, MA, USA)

In situ wear experiments in the scanning Auger spectrometer 132
W. A. Glaeser (Columbus, OH, USA), D. Baer and M. Engelhardt (Richland, WA, USA)

Effects of erodent recycling in solid particle erosion testing 139
A. J. Sparks and I. M. Hutchings (Cambridge, UK)

Influence of nozzle roughness on conditions in a gas-blast erosion rig 148
P. H. Shipway and I. M. Hutchings (Cambridge, UK)

Rolling–sliding behavior of rail steels 159
M. Sato, P. M. Anderson and D. A. Rigney (Columbus, OH, USA)

Microstructure and wear resistance of pearlitic rail steels 173
A. J. Perez-Unzueta and J. H. Beynon (Leicester, UK)

Study on the microstress and size of mosaic block and their relationship to the wear resistance of steels 183
Y. Wang (Beijing, China), X. Sun, S. Xu (Tianjin, China) and J. Liu (Beijing, China)

Plastic deformation and damage accumulation below the worn surfaces 188
A. T. Alpas, H. Hu and J. Zhang (Windsor, Ont., Canada)

Study on reduction in wear due to magnetization. 196
K. Kumagai (Akita, Japan), K. Suzuki (Sendai, Japan) and O. Kamiya (Akita, Japan)

Tribological behavior of a titanium–nickel alloy 202
P. Clayton (Beaverton, OR, USA)

Further investigation on the tribological behavior of Cu–20% Nb *in situ* composite 211
P. Liu, S. Bahadur and J. D. Verhoeven (Ames, IA, USA)

Sliding friction and wear of ceramics in neutral, acid and basic aqueous solutions. 220
B. Löffelbein, M. Woydt and K.-H. Habig (Berlin, Germany)

Effects of surfactants on the tribological properties of a Cr_2O_3 coating 229
J. Wei and Q. Xue (Lanzhou, China)

The combined effect of speed and humidity on the wear and friction of silicon nitride 234
M. G. Gee and D. Butterfield (Teddington, UK)

Role of indentation fracture in free abrasive machining of ceramics 246
R. Chauhan, Y. Ahn, S. Chandrasekar and T. N. Farris (West Lafayette, IN, USA)

Grain size effect on abrasive wear mechanisms in alumina ceramics 258
A. K. Mukhopadhyay and Y.-W. Mai (Sydney, NSW, Australia)

Effect of grain size on friction and sliding wear of oxide ceramics 269
K.-H. Zum Gahr, W. Bundschuh and B. Zimmerlin (Karlsruhe, Germany)

Solid-particle erosion of *in situ* reinforced Si_3N_4. 280
M. Marrero, J. Routbort (Argonne, IL, USA), P. Whalen, C.-W. Li (Morristown, NJ, USA) and K. R. Karasek (Des Plaines, IL, USA)

SEM studies of material damage in alumina ceramics by angular single and multiple particle impacts 285
J. Zhou (Prairie View, TX, USA) and S. Bahadur (Ames, IA, USA)

High speed sliding of Al_2O_3 pins against an En-24 steel disc 296
A. Ravikiran and B. N. Pramila Bai (Bangalore, India)

Wear mechanisms of silicon nitride, partially stabilized zirconia and alumina in unlubricated sliding against steel 305
P. Gautier and K. Kato (Sendai, Japan)

Effect of microstructure on the wear transition of zirconia-toughened alumina 314
C. He, Y. S. Wang, J. S. Wallace and S. M. Hsu (Gaithersburg, MD, USA)

A transmission electron microscopy study of wear of magnesia partially stabilised zirconia 322
W. M. Rainforth (Sheffield, UK) and R. Stevens (Leeds, UK)

Ball-on-flat reciprocating sliding wear of single-crystal, semiconductor silicon at room temperature. 332
E. Zanoria and S. Danyluk (Chicago, IL, USA)

Effect of fretting on electroplated Pd–Ni contacts. 339
H. Murata (Shizuoka, Japan), Y. Imada, F. Honda and K. Nakajima (Nagoya, Japan)

Gross slip criteria in fretting. 347
O. Vingsbo and J. Schön (Houston, TX, USA)

Surface temperatures and fretting corrosion of steel under conditions of fretting contact 357
H. M. Ghasemi, M. J. Furey and C. Kajdas (Blacksburg, VA, USA)

Microwear processes of polymer surfaces 370
R. Kaneko (Tokyo, Japan) and E. Hamada (Gunma, Japan)

Macroscopic and microscopic wear mechanisms in ultra-high molecular weight polyethylene 378
J. R. Cooper, D. Dowson and J. Fisher (Leeds, UK)

Tribological behavior of unidirectional graphite–epoxy and carbon–PEEK composites 385
B. S. Tripathy and M. J. Furey (Blacksburg, VA, USA)

The transfer and wear of nylon and CuS–nylon composites: filler proportion and counterface characteristics 397
S. Bahadur and D. Gong (Ames, IA, USA)

The failure of poly (ether ether ketone) in high speed contacts 407
B. J. Briscoe, B. H. Stuart, S. Sebastian (London, UK) and P. J. Tweedale (Warrington, UK)

Tribological behavior of blends of polyether ether ketone and polyether imide 418
J. H. Yoo and N. S. Eiss Jr. (Blacksburg, VA, USA)

Increasing wear resistance in polymer-based composites using radiation-modified polymeric additives 426
Yu. M. Pleskachevskii, V. V. Smirnov and V. N. Aderikha (Gomel, Belarus)

Wear deformation of ordered Fe–Al intermetallic alloys 432
H. E. Maupin, R. D. Wilson and J. A. Hawk (Albany, OR, USA)

Tribological stability of metallic materials at elevated temperatures 441
H. Berns (Bochum, Germany) and A. Fischer (Neumünster, Germany)

Reactions during preparation and sliding of sintered Fe–Mo–S wear-resistant materials 450
G. Zhang, J. Ouyang, X. Meng, L. Ma, S. Qi and F. Zhang (Lanzhou, China)

Experimental study of self-welding of materials in high temperature liquid sodium 458
S. Chander, C. Meikandamurthy, R. D. Kale (Kalpakkam, Tamil Nadu, India) and R. Krishnamurthy (Madras, India)

Study of the comet-shaped carbides in the uppermost surface layer of bearings 466
F. Meng, R. Tang and K. Tagashira (Muroran, Japan)

Friction and wear of self-lubricating composites at temperatures to 450 °C in vacuum 471
M. Suzuki, M. Moriyama, M. Nishimura and M. Hasegawa (Tokyo, Japan)

Micromechanics of MoS_2 lubrication. 480
C. Gao, L. Bredell, D. Kuhlmann-Wilsdorf and D. D. Makel (Charlottesville, VA, USA)

Wear of selected materials and composites sliding against MoS_2 films 492
A. W. Ruff and M. B. Peterson (Gaithersburg, MD, USA)

Wear reduction by pyrolytic carbon on tribosurfaces 498
J. L. Lauer, B. L. Vlcek and B. L. Sargent (Troy, NY, USA)

Wear reduction systems for coal-fueled diesel engines
I. The basics of powder lubrication 508
H. Heshmat (New York, NY, USA)

Wear reduction systems for coal-fueled diesel engines
II. Experimental results and hydrodynamic model of powder lubrication 518
H. Heshmat (New York, NY, USA)

Abrasion, erosion and scuffing resistance of carbide and oxide ceramic thermal sprayed coatings for different applications 529
G. Barbezat, A. R. Nicoll (Wohlen, Switzerland) and A. Sickinger (Irvine, CA, USA)

Hardness, friction and wear of multiplated electrical contacts. 538
P. A. Engel (Binghamton, NY, USA), E. Y. Hsue (Endicott, NY, USA) and R. G. Bayer (Vestal, NY, USA)

Erosive wear behavior of chemical vapor deposited multilayer tungsten carbide coating 552
D. Garg and P. N. Dyer (Allentown, PA, USA)

Rolling-contact-fatigue wear characteristics of diamond-like hydrocarbon coatings on steels 558
R. Wei, P. J. Wilbur (Fort Collins, CO, USA), M.-J. Liston (Ann Arbor, MI, USA) and G. Lux (Redwood City, CA, USA)

Study of antiwear adhesive coating under different erosion conditions 569
X.-D. Ma, F.-Y. Lin and H.-S. Shao (Beijing, China)

Short Communications

Galling in aluminum alloys and Duralcan aluminum matrix composites 574
P. Wycliffe (Kingston, Ont., Canada)

Wear characteristics of nitrogenated chromium cast irons 580
N. S. Poonawala, A. K. Chakrabarti and A. B. Chattopadhyay (Kharagpur, India)

Scratch tests on iron-, nickel- and cobalt-based alloys at elevated temperatures. 585
H. Berns (Bochum, Germany), A. Fischer (Neumünster, Germany) and J. Kleff (Bochum, Germany)

Detection of wear cracks by photothermal radiometry 590
J. L. Bodnar, C. Menu, M. Egée (Reims, France), P. Pigeon and A. Le Blanc (Gif-sur-Yvette, France)

A SEM/AES/XPS tribometer for rolling and sliding contacts 593
Y. Naerheim (Thousand Oaks, CA, USA)

Sliding wear studies using acoustic emission 597
S. Lingard, C. W. Yu and C. F. Yau (Hong Kong, Hong Kong)

On-line wear monitoring using acoustic emission 605
K. Matsuoka, D. Forrest and M.-K. Tse (Cambridge, MA, USA)

A study on the relationship between the magnetic properties of a worn surface layer and the wear resistance. 611
B. Zhang, Y. Liu and W. Shen (Beijing, China)

Wear mechanism maps of 440C martensitic stainless steel 614
A. J. Slifka, T. J. Morgan, R. Compos (Boulder, CO, USA) and D. K. Chaudhuri (Nashville, TN, USA)

Effect of external loading on wear maps of aluminium alloys 619
Z. R. Zhou and L. Vincent (Ecully, France)

Microstructural characterization of fretting damage 624
R.-M. Lundh, Z. Lai and H. Nordén (Gothenburg, Sweden)

Wear and friction of medical grade polyurethane sliding on smooth metal counterfaces 627
Z. M. Jin, D. Dowson and J. Fisher (Leeds, UK)

Tribological characteristics of filled ultrahigh molecular weight high density polyethene 631
N. Ramasubramanian, R. Krishnamurthy and S. K. Malhotra (Madras, India)

Wear behaviour of plasma-sprayed partially stabilized zirconia on a steel substrate 636
H. S. Ahn and O. K. Kwon (Seoul, South Korea)